



UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office

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SERIAL NUMBER	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
08/470,424	06/06/95	YOKOMIZO	

22M2/0512  
ANTONELLI TERRY STOUT & KRAUS  
SUITE 1800  
1300 NORTH SEVENTEENTH STREET  
ARLINGTON VA 22209

EXAMINER	
BEHREND, H	
ART UNIT	PAPER NUMBER
2204	14

05/12/97

DATE MAILED:

This is a communication from the examiner in charge of your application.  
COMMISSIONER OF PATENTS AND TRADEMARKS

☐ This application has been examined ☒ Responsive to communication filed on \_\_\_\_\_ ☒ This action is made final.

A shortened statutory period for response to this action is set to expire 3 month(s), \_\_\_\_\_ days from the date of this letter.  
Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

- |   |   |
|---|---|
| 1. <input checked="" type="checkbox"/> Notice of References Cited by Examiner, PTO-892. | 2. <input type="checkbox"/> Notice of Draftsman's Patent Drawing Review, PTO-948. |
| 3. <input type="checkbox"/> Notice of Art Cited by Applicant, PTO-1449.                 | 4. <input type="checkbox"/> Notice of Informal Patent Application, PTO-152.       |
| 5. <input type="checkbox"/> Information on How to Effect Drawing Changes, PTO-1474.     | 6. <input type="checkbox"/> _____   |

Part II SUMMARY OF ACTION

1. ☒ Claims 4-7, 23-37 are pending in the application.  
Of the above, claims 24-29 are withdrawn from consideration.

2. ☐ Claims \_\_\_\_\_ have been cancelled.
3. ☐ Claims \_\_\_\_\_ are allowed.
4. ☒ Claims 4-7, 23, 30-37 are rejected.
5. ☐ Claims \_\_\_\_\_ are objected to.
6. ☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.
7. ☐ This application has been filed with informal drawings under 37 C.F.R. 1.85 which are acceptable for examination purposes.
8. ☐ Formal drawings are required in response to this Office action.
9. ☐ The corrected or substitute drawings have been received on \_\_\_\_\_. Under 37 C.F.R. 1.84 these drawings are ☐ acceptable; ☐ not acceptable (see explanation or Notice of Draftsman's Patent Drawing Review, PTO-948).
10. ☐ The proposed additional or substitute sheet(s) of drawings, filed on \_\_\_\_\_, has (have) been ☐ approved by the examiner; ☐ disapproved by the examiner (see explanation).
11. ☒ The proposed drawing correction, filed 3/29/96, has been ☒ approved; ☐ disapproved (see explanation).
12. ☐ Acknowledgement is made of the claim for priority under 35 U.S.C. 119. The certified copy has ☐ been received ☐ not been received ☐ been filed in parent application, serial no. \_\_\_\_\_; filed on \_\_\_\_\_.
13. ☐ Since this application appears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.
14. ☐ Other

EXAMINER'S ACTION

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1. Newly submitted claims 24-29 are directed to an invention that is independent or distinct from the invention originally presented and, originally elected in the 3/29/96 response.

The originally presented invention as set forth in original claims 1-23, is to an apparatus (and species thereof) classifiable in class 376 subclass 444.

The 2/29/96 Office action set forth a requirement of election of species of said apparatus.

Applicant in the paper filed 3/29/96, responded to said Office action by electing the species designated I, B.

Newly submitted claims 24-29 are directed to a method classifiable in class 376 subclass 210.

The invention set forth in the newly submitted claims 24-29 and the originally presented invention set forth in original claims 1-23, are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP 806.05(e)). In this case, the apparatus as claimed can be used to practice another and materially different process such as a process wherein a predetermined water surface between the cooling water and a vapor in the water rod is maintained throughout the whole fuel cycle, or a process such as a

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process wherein the water rod is completely filled with water throughout the whole fuel cycle.

Accordingly, the apparatus invention of original claims 1-23 has been constructively elected by original presentation of claims as well as by applicants specific election (in the 3/29/96 response) of species I, B of said apparatus claims for prosecution on the merits. Newly submitted claims 24-29 are accordingly withdrawn from further consideration as being drawn to a non-elected invention. See 37 CFR 1.142(b), 37 CFR 1.145 and MPEP 821.03.

2. Applicants election with traverse of species I, B, in the 3/29/96 response is acknowledged. Applicant argues that the election of species requirement is improper because claim 1 had not been rejected in the 2/29/93 Office action. Such however, is not a requirement before an election of species is made. Claim 1 is rejected in this Office action.

The examiner does not agree with applicant as to the claims which read on each of the elected species of I and B.

Claim 3 and claims 16-22 are directed to either specie II or specie III.

Claims 8, 9, 10-15 are directed to specie J.

Accordingly, claims 1, 2, 4-7 and 23 appear readable on each of the elected species of I and B.

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If applicant considers any of claims 1, 2, 4-7 and 23 as actually being specific to one of the non-elected species (for example, due to some special meaning being given to the claim language), it is applicants responsibility to so inform the Office in the next response.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. § 103, the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 C.F.R. § 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of potential 35 U.S.C. § 102(f) or (g) prior art under 35 U.S.C. § 103.

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

(g) before the applicant's invention thereof the invention was made in this country by another who had not abandoned, suppressed, or concealed it. In determining priority of invention there shall be considered not only the respective

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dates of conception and reduction to practice of the invention, but also the reasonable diligence of one who was first to conceive and last to reduce to practice, from a time prior to conception by the other.

The following is a quotation of 35 U.S.C. § 103 which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

5. Claims 1, 2, 4, 7, 23 are rejected under 35 U.S.C. § 102(b) as being clearly anticipated by Patterson et al.

Patterson et al (note Fig. 1) show the claimed structure of a fuel assembly having a plurality of fuel rods 10 held between upper tie plate 12 and lower tie plate 6, a plurality of fuel spacers 16 and, at least one water rod 18.

Patterson et al in Fig. 4 show the water rod 18 having a coolant ascending path and a coolant descending path.

Said Fig. 4 of Patterson et al shows the coolant ascending path as having a coolant inlet port open in a region below the lower fuel rod supporting tie plate 6 and, the coolant descending

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path as having a coolant delivery port 30 arranged in a position higher than the lower fuel rod supporting tie plate 6.

Note that Fig. 1 of Patterson et al show flow openings through the lower tie plate (fuel rod support grid). The claimed "resistance member" reads on the lower tie plate of Patterson et al.

Claim 23 recites a means for controlling the amounts of voids in the water rods. As indicated even by applicants own specification, the formation of voids in the water rods is dependent on the amount or rate of coolant flow produced by the circulation pump. Patterson et al refer to flowing coolant through the fuel assembly and in this art, this flow is inherently obtained through use of a circulation pump. Such pumps are inherently capable of operation at different flow rates. Thus, the use of a circulation pump which can operate at different flow rates and consequently produce different amounts of voids in the water rods is considered inherent in the teachings of Patterson et al.

As to limitations which are considered to be inherent in a reference, note the case law of In re Ludtke, 169 USPQ 563, In re Swinehart, 169 USQP 226, In re Fitzgerald, 205 USPQ 594, In re Best et al, 195 USPQ 430, and In re Brown, 173 USPQ 685, 688.

6. Claims 1, 2, 5, 7, 23 are rejected under 35 U.S.C. § 102(a, b, e, g) as being clearly anticipated by Matzner.

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Matzner shows the claimed structure of a fuel assembly having a plurality of fuel rods R (which inherently contain fuel pellets) held between upper and lower tie plates (U, L), spacers and at least one water rod W (e.g. see Fig. 1 and cols. 1, 2, 3).

The water rod W has a coolant inlet 14 open in a region below the lower tie plate L. Water rod W has a coolant ascending path inside conduit 14 (which becomes standpipe 15) and, a coolant descending path in the annulus between pipes 15 and 18 with coolant delivery ports 20. The claimed "resistance member" reads on the lower tie plate of Matzner.

Claim 23 recites a means for controlling the amounts of voids in the water rods. As indicated even by applicants own specification, the formation of voids in the water rods is dependent on the amount or rate of coolant flow produced by the circulation pump. Matzner refers to flowing coolant through the core by means of "conventional circulation pumps" (col. 3 lines 64+). Such pumps are inherently capable of operation at different flow rates. Thus, the use of a circulation pump which can operate at different flow rates and consequently produce different amounts of voids in the water rods is considered inherent in the teachings of Matzner.

As to limitations which are considered to be inherent in a reference, note the case law of In re Ludtke, 169 USPQ 563, In re

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Swinehart, 169 USPQ 226, In re Fitzgerald, 205 USPQ 594, In re Best et al, 195 USPQ 430, and In re Brown, 173 USPQ 685, 688.

7. Claims 1, 2, 4-7, 23 are rejected under 35 U.S.C. § 103 as being unpatentable over Patterson et al in view of either Matzner or Nelson et al.

Claim 5 recites the upper end of the coolant ascending path as being at a position lower than the upper end of the pellet-filled region.

Such however, represents no more than a conventionally known alternative expedient in this art as evidenced for example by the teaching thereof in either secondary reference and to so modify Patterson et al would accordingly have been prima facie obvious (note for example Fig. 1 of Nelson et al).

Claim 6 recites the coolant delivery port as being positioned near the lower end of the fuel pellet-filled region. Such however represents no more than a conventionally known expedient in the art and its use in Patterson et al would accordingly have been prima facie obvious.

8. Claims 1, 2, 4-7, 23 are rejected under 35 U.S.C. § 103 as being unpatentable over Matzner in view of either Patterson et al or Nelson et al.

Claim 4 recites the coolant ascending path as extending beyond the upper end of the fuel pellet-filled region.



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Such however represent no more than a conventionally known alternative expedient in this art as evidenced for example by the teachings thereof in either secondary reference and to so modify Matzner would accordingly have been prima facie obvious (note for example Fig. 7 of Nelson et al).

9. Claims 1, 2, 4-7, 23 are rejected under 35 U.S.C. § 103 as being unpatentable over Patterson et al in view of either Matzner or Kumpf.

Claim 6 recites the coolant delivery port as being positioned near the lower end of the fuel pellet-filled region. Such however represents no more than a conventionally known and advantageous expedient in this art as evidenced for example by the teachings thereof in either Matzner or Kumpf (note fig. 10) and to so modify Patterson et al would accordingly have been prima facie obvious

Claim 5 sets forth no more than a conventionally known art alternative and as such, it is hence prima facie obvious.

10. Claim 23 is rejected under 35 U.S.C. § 103 as being unpatentable over either Matzner or Patterson et al in view of Japan 0220686.

The claim recites a means for controlling the amounts of voids in the water rods.

Japan 0220686 shows that the amount of voids in the water rods can be changed by increasing or decreasing the coolant flow

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and that the number of voids (or void fraction) in the water rod can even be decreased to zero by increasing the coolant flow rate.


Accordingly, it would have been prima facie obvious to have provided for producing voids (and for changing the amount of voids (including down to zero percent voids)) in the water rods of either primary reference as shown to be old and advantageous in the art by Japan 0220686.

11. The other references cited further illustrate pertinent art.

12. Any inquiry concerning this communication should be directed to Mr. Behrend at telephone number (703) 305-1831.

Behrend/gj-17

6-12-96



HARVEY E. BEHREND  
PRIMARY EXAMINER  
GROUP 2200